# Musculoskeletal Care

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# Overview

- Musculoskeltal Review
- Injuries to Bones
- Splinting

# Musculoskeletal Review

- Anatomy review
- The skeletal system
- Injuries to bones
- Mechanism of injury

- Direct force
- Indirect force

# Twisting force

- Bone or joint injuries
- Types
  - Open - break in the continuity of the skin
  - Closed - no break in the continuity of the skin

- Signs and symptoms
  - Deformity or angulation
  - Pain and tenderness
  - Grating
  - Swelling
  - Bruising (discoloration)

- Exposed bone ends
- Joint locked into position
- Emergency medical care of bone or joint injuries
  - Body substance isolation
  - Administer oxygen if not already done and indicated.
  - After life threats have been controlled, splint injuries in preparation for transport.
  - Application of cold pack to area of painful, swollen, deformed extremity to reduce swelling.
  - Elevate the extremity.

# Splinting

- Reasons
  - Prevent motion of bone fragments, bone ends or angulated joints.

# Splinting - minimize the following complications:

- Damage to muscles, nerves, or blood vessels caused by broken bones.
- Conversion of a closed painful, swollen, deformed extremity to an open painful, swollen, deformed extremity.

# Splinting - minimize complications(cont'd)

- Restriction of blood flow as a result of bone ends compressing blood vessels.
- Excessive bleeding due to tissue damage caused by bone ends.
- Increased pain associated with movement of bone ends.
- Paralysis of extremities due to a damaged spine.

# General rules of splinting

- Assess pulse, motor, and sensation distal to the injury prior to and following splint application and record findings.
- Immobilize the joint above and below the injury.
- Remove or cut away clothing.

# Splinting Rules

- Cover open wounds with a sterile dressing.
- If there is a severe deformity or the distal extremity is cyanotic or lacks pulses, align with gentle traction before splinting.
- Do not intentionally replace the protruding bones.

# Splinting Rocks

- Pad each splint to prevent pressure and discomfort to the patient.
- Splint the patient before moving when feasible and no life threats.
- When in doubt, splint the injury when feasible and no life threats.

# Splinting Rolls

- If patient has signs of shock (hypoperfusion), align in normal anatomical position and transport (Total body immobilization. Example:  Backboard takes care of all immobilization on emergency basis).

# Equipment

- Rigid splints
- Traction splints
- Pneumatic splints (air, vacuum)
- Improvised splints, pillow
- Pneumatic Anti Shock Garment (as a splint)

# Hazards of improper splinting

- Compression of nerves, tissues and blood vessels from the splint
- Delay in transport of a patient with life threatening injury
- Splint applied too tight on the extremity reducing distal circulation

# Hazards - Splinting

- Aggravation of the bone or joint injury
- Cause or aggravate tissue, nerve, vessel or muscle damage from excessive bone or joint movement.

# Special considerations of splinting

- Long bone splinting procedure
  - Body substance isolation
  - Apply manual stabilization.
  - Assess pulse, motor and sensory function.
  - If there is a severe deformity or the distal extremity is cyanotic or lacks pulses, align with gentle traction before splinting.

# Long Bone Splinting Pro. (cont'd)

- Measure splint.
- Apply splint immobilizing the bone and joint above and below the injury.
- Secure entire injured extremity.
- Immobilize hand/foot in position of function.
- Reassess pulse, motor, and sensation after application of splint and record.

# Special Considerations of Splinting(cont'd)

- Splinting a joint injury
- Body substance isolation
- Apply manual stabilization.
- Assess pulse, motor and sensory function.

# Special Considerations(cont'd)

- Align with gentle traction if distal extremity is cyanotic or lacks pulses and no resistance is met.
- Immobilize the site of injury.
- Immobilize bone above and below the site of injury.
- Reassess pulse, motor and sensation after application of splint and record.

# Traction Splinting

- Indications for use is a painful, swollen, deformed mid-thigh with no joint or lower leg injury.

# Traction Splinting

- Contraindications of the use of a traction splint
  - Injury is close to the knee
  - Injury to the knee exists
  - Injury to the hip
  - Injured pelvis

# Traction Splinting - contraindications(cont'd)

- Partial amputation or avulsion with bone separation, distal limb is connected only by marginal tissue. Traction would risk separation.
- Lower leg or ankle injury.

# Traction Splint Application Procedure

- Assess pulse, motor, and sensation distal to the injury and record.
- Body substance isolation
- Perform manual stabilization of the injured leg.
- Apply manual traction - required when using a bi-polar traction splint.

# Traction Splint Application(cont'd)

- Prepare/adjust splint to proper length.
- Position splint under injured leg.
- Apply proximal securing device (ischial strap).
- Apply distal securing device (ankle hitch).

# Traction Splint Application(cont'd)

- Apply mechanical traction.
- Position/secure support straps.
- Re-evaluate proximal/distal securing devices.

# Traction Splint Application(cont'd)

- Reassess pulses, motor, sensation distal to the injury after application of the splint and record.
- Secure torso to the longboard to immobilize hip.
- Secure splint to the long board to prevent movement of splint.

Questions? ?

# Summary

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- Injuries to Bones
- Splinting